

REMARKS

Claim 1 is amended herein. Claims 1-9 and 24-27 remain pending in the captioned case. Reconsideration and further examination of the presently claimed application are respectfully requested.

Section 112 Rejections

Claims 1-9 and 24-29 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, claim 1 is rejected for lacking antecedent basis and for being vague and indefinite. Claims 2-9 and 24-27 were rejected for being dependent on a rejected base claim. Applicants would like to point out that only claims 1-9 and 24-27 are pending in the application.

With regard to claim 1, the phrases “the planar portions” and “the extension” are rejected for lacking appropriate antecedent basis. In addition, the step of “resonating each of the resonant circuit elements at a carrier frequency of the signal transmitted by one of the pair of antennas” is rejected as being vague and indefinite because it is unclear how such a step applies to the method of forming the apparatus (Office Action — pg. 2). To expedite prosecution, claim 1 is amended in a manner believed to obviate this rejection. In particular, claim 1 is amended to delete the amendments made in Applicant’s previous response filed February 24, 2011.

Claim 1 was amended in Applicant’s response filed February 24, 2011 to overcome a 35 U.S.C. § 112, second paragraph, rejection in which the Examiner stated that the claim omitted the allegedly essential step of “providing a wavelength of a carrier frequency of a signal transmitted by one of the pair of antennas.” However, the steps of “providing a wavelength of a carrier frequency of a signal transmitted by one of the pair of antennas” and “resonating each of the resonant circuit elements at a carrier frequency of the signal transmitted by one of the pair of antennas” belong in

a method of using the apparatus — not in a method of forming the apparatus. Thus, these limitations are deleted herein.

As noted in Applicant's previous Response filed May 28, 2010, claim 1 was amended to specify that the length of the apparatus is substantially equal to one-half of the carrier signal wavelength which, as noted in the Board Decision, is a fixed frequency. In making such an amendment, the claim was rendered definite by removing any ambiguity from the claim language.

However, Applicants believe that the Examiner will maintain the contention that the carrier frequency must be known in order to form the apparatus with the claimed length. In an effort to expedite prosecution and to further assuage the Examiner's concerns that the "carrier frequency is unknown" (see, e.g., Examiner's Answer mailed June 18, 2008, pg. 3) in the previously presented claim language, claim 1 is amended herein to clarify that each of the plurality of resonant circuit elements are configured to resonate at a known carrier frequency of a signal transmitted by one of the pair of antennas. Support for the amendment made to claim 1 may be found, e.g., in the present specification, pg. 30, line 16 – pg. 31, line 34. By further specifying that the carrier frequency of the transmitted signal is known, the present amendment ensures that a skilled artisan would have no trouble in forming the apparatus to have a length substantially equal to one-half of a wavelength corresponding to the known carrier frequency.

For at least the above stated reasons, Applicants request removal of this rejection in its entirety.

Section 103 Rejection

Claims 1-9 and 24-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,411,261 to Lilly (hereinafter "Lilly") in view of U.S. Patent No. 6,542,131 to Haapanen (hereinafter "Haapanen"). As stated above, the present application does not include claims numbered 28-29.

To establish a case of *prima facie* obviousness of a claimed invention, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Second, there must be a reasonable expectation of success. As stated in MPEP 2143.01, the fact that references can be hypothetically combined or modified is not sufficient to establish a *prima facie* case of obviousness. See *In re Mills*, 916 F.2d. 680 (Fed. Cir. 1990). Finally, the prior art references must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d. 981 (CCPA 1974); MPEP 2143.03. Specifically, “all words in a claim must be considered when judging the patentability of that claim against the prior art.” *In re Wilson* 424 F.2d., 1382 (CCPA 1970).

Furthermore, in response to the recent U.S. Supreme Court decision in *KSR Int’l Co. v. Teleflex, Inc.* (U.S. 2007), new guidelines were set forth for examining obviousness under 35 U.S.C. § 103. The U.S. Supreme Court reaffirmed the *Graham* factors and, while not totally rejecting the “teachings, suggestion, or motivation” test, the Court appears to now require higher scrutiny on the part of the U.S. Patent & Trademark Office. In accordance with the recently submitted guidelines, it is “now necessary to identify the reason” why a person of ordinary skill in the art would have combined the prior art elements, or at least describe the pertinence of the prior art elements set forth in the cited disclosure, in the manner presently claimed. Moreover, even if combined, the *Graham* factors require that a determination of the differences between the combined prior art and the claims at issue is needed. Using these standards, Applicants contend that the Office Action fails to note substantial differences between the combined references and the claims at issue. Some distinctive features of the presently pending claims are set forth in more detail below.

Lilly and Haapanen fail to form an apparatus configured to reduce electromagnetic interference between a pair of antennas, wherein said apparatus comprises a plurality of resonant circuit elements, each configured to resonate at a known carrier frequency of a signal transmitted by one of the pair of antennas. As noted above, claim 1 is amended to state that each of the plurality of resonant circuit elements is configured to resonate at a known carrier frequency.

Support for the amendment made to claim 1 may be found, e.g., in the present specification, pg. 30, line 16 – pg. 31, line 34. As such, the amendment made to claim 1 does not introduce new matter.

The specification teaches that each of the resonant circuit elements comprises a capacitive portion and an inductive portion. In the embodiment of FIGS. 7A-E, e.g., the capacitive portions are formed through interaction of the rectangular elements 710 with the common reference plane 730, while the inductive portions are formed by the vertical elements 720. In order to effectively scatter electromagnetic energy away from an affected radio, the capacitive and inductive portions must be carefully balanced to set the resonant frequency of apparatus 700 equal to the carrier frequency of a signal transmitted by the other radio. By setting the resonant frequency of the apparatus equal to the carrier frequency of the transmitted signal, the capacitive and inductive portions of the apparatus can be designed to resonate at the carrier frequency in accordance with EQ. 6. However, as different embodiments of the apparatus are governed by different capacitive and inductive equations, designing the capacitive and inductive portions to resonate at the carrier frequency is an intentional, carefully thought out process (Specification — pg. 31, line 30 – pg. 34, line 9).

Statements in the final Office Action allege that Lily provides teaching for folding a shape into a plurality of resonant circuit elements, each configured to resonate at a carrier frequency of a signal transmitted by one of the pair of antennas (final Office Action — pg. 3). In support of the “plurality of resonant circuit elements” allegedly disclosed by Lily, the Examiner states “Fig. 2B [of Lily] has the same configuration as Fig. 7D of the application” and cites col. 1, lines 28-32 of Lily for allegedly disclosing that each of the plurality of resonant circuit elements is configured to resonate at a carrier frequency of a signal transmitted by one of the pair of antennas. Applicants hereby traverse such statements.

Although the AMC 100 shown in Fig. 2B of Lily includes one or more horizontally-oriented conductive shapes 110 coupled to a substrate 112 via one or more vertical posts 106, which may

function as capacitive portions (110/112) and inductive portions (106), respectively, Lily provides absolutely no teaching or suggestion for designing the capacitive and inductive portions of the so-called resonant circuit elements, so that each element will resonate at a carrier frequency of a signal transmitted by an antenna. The Examiner alleges that such teaching can be found in col. 1, lines 28-32 of Lily. Applicants respectfully disagree. The cited passage merely states that, “[n]ear the resonant frequency of the structure, the reflection amplitude is near unity and the reflection phase at the surface is near zero degrees.” Noting that the AMC structure has a resonant frequency does not provide teaching or suggestion for setting the resonant frequency of the structure equal to a carrier frequency of a signal transmitted by an antenna.

Furthermore, the suggestion that the AMC 100 shown in Fig. 2B of Lily appears similar to the apparatus shown in Fig. 7D of the application fails to provide any indication whatsoever that the so-called resonant circuit elements shown in Fig. 2B of Lily are actually configured to resonate at the claimed carrier frequency. As noted above and described in the present specification, designing the capacitive and inductive portions of the apparatus to resonate at a particular frequency (i.e., a carrier frequency of a signal transmitted by an antenna) is an intentional, carefully thought out process, which involves careful balancing of electromagnetic equations governed by the geometric properties of the capacitive and inductive portions. Unlike the presently claimed case, Lily provides absolutely no guidance that would enable a skilled artisan to design the capacitive and inductive portions of the AMC, so that the so-called resonant circuit elements shown in Fig. 2B of Lily would be able to resonate at a particular frequency, much less a carrier frequency of a signal transmitted by an antenna. As such, Lily fails to provide teaching, suggestion or motivation for configuring a plurality of resonant circuit elements as claimed.

Although not relied upon for such purpose, Applicants contend that the teachings of Haapanen cannot be combined with those of Lily to overcome the deficiencies therein.

Haapanen discloses an apparatus for suppressing mutual interference between antennas (Haapanen, Title). In order to reduce interference between the antennas (1, 2, Fig. 1), Haapanen

places a round bar or strip (5), having the shape of an elongated rectangle, between the antennas in a direction parallel to the supporting arms (10, 20) of the antennas (Haapanen — col. 2, lines 15-23). Although described as a “resonator” (Haapanen — col. 2, lines 33-34), the round bar or strip (5) disclosed by Haapanen does not include a plurality of resonant circuit elements. As such, Haapanen provides absolutely no teaching or guidance for configuring a plurality of resonant circuit elements, so that each of the elements may resonate at a carrier frequency of a signal transmitted by one of the antennas (1,2). Thus, even if the teachings of Haapanen were combined with those of Lily, the combined teachings of the cited art would still fail to provide the guidance necessary for a skilled artisan to configure a plurality of resonant circuit elements as claimed.

For at least the reasons set forth above, claim 1 and claims dependent therefrom are patentably distinct over the cited art. Accordingly, removal of this rejection is respectfully requested.

Lily and Haapanen fail to teach or suggest wherein by the steps of extracting and folding, the apparatus is formed such that a combined length of the plurality of resonant circuit elements is substantially equal to one-half of a wavelength corresponding to a known carrier frequency. As noted above, claim 1 is patentably distinct over the teachings of Lily and Haapanen. However, for the sake of expediting prosecution, claim 1 is further amended herein to clarify the claimed invention over that which is taught by Lily and Haapanen. In particular, claim 1 is amended to state that it is the combined length of the plurality of resonant circuit elements that is substantially equal to one-half of a wavelength corresponding to the known carrier frequency. Support for the amendment made to claim 1 may be found in the present specification, e.g., on page 30, line 16 – page 44, line 27 and Figs. 7C, 10B, 11B and 12B. As such, the amendment made to claim 1 does not introduce new matter.

As noted throughout prosecution, Lily fails to provide teaching, suggestion or motivation for forming an apparatus in which a length of the apparatus is substantially equal to one-half of a (carrier) signal wavelength. See, e.g., Applicant’s arguments presented on pages 6-11 of the

Supplemental Appeal Brief filed on February 27, 2008. The Examiner agrees and admits on page 3 of the final Office Action that "Lily does not teach the apparatus is formed having a length substantially equal to one-half of a wavelength [corresponding] to the carrier frequency." However, the Examiner alleges it would have been obvious for a skilled artisan to form the apparatus of Lily so as to have the claimed length, because (a) *In re Aller* states that where the general condition (forming resonant circuit elements) of a claim are disclosed in the prior art, discovering the optimum or workable ranges (length of the apparatus) involves only routine skill in the art, or alternatively, (b) Haapanen discloses an apparatus 5 having the claimed length and, thus, can be combined with Lily (final Office Action — pages 3-4). Applicants hereby traverse such statements.

(a) The Examiner improperly relies on *In re Aller* to support his allegation of obviousness over Lily. *In re Aller* states, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955); MPEP 2144.05. However, the findings within *In re Aller* pertain only to overlapping ranges of a particular parameter. Specifically, when a particular parameter is recognized by the art, but disclosed as having a different value or range than claimed. In order to properly apply a *prima facie* case of obviousness based on overlapping ranges, Applicants contend that the Examiner must first prove that Lily recognizes the particular parameter to be optimized.

As further noted in MPEP 2144.05, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Contrary to the presently claimed case, Lily fails to recognize the apparatus length as a result-effective variable (i.e., the variable in the presently claimed case which achieves the recognized result of maximum interference reduction). In fact, and as noted on page 8 of the

Supplemental Appeal Brief filed February 27, 2008, Lily fails to even mention the apparatus (AMC) as having a length. As Lily fails to mention the apparatus length, much less recognize the apparatus length as a result-effective variable, Applicants contend that it would not be possible for a skilled artisan having the benefit of Lily's teachings to discover the optimum or workable ranges of the apparatus length through routine experimentation.

(b) The teachings of Haapanen cannot be combined with those of Lily to overcome the deficiencies therein. The Examiner alleges that Haapanen provides teaching for "an apparatus (5) having a length substantially equal to one-half of a wavelength (see Col. 2, lines 47-49) to the carrier frequency of one of the antennas (1,2) for suppressing mutual interference between antennas placed [sic] close to each other (see Abstract)" (final Office Action — page. 3). As such, the Examiner concludes that it would have been obvious to one having ordinary skill in the art to modify the invention of Lily to have an apparatus length substantially equal to one-half of a wavelength corresponding to the carrier frequency as taught by Haapanen (final Office Action — pages 3-4). Applicants disagree and contend that the teachings of Haapanen cannot be combined with those of Lily to overcome the deficiencies therein.

As noted above, claim 1 is amended to clarify that it is the combined length of the plurality of resonant circuit elements that is substantially equal to one-half of a wavelength corresponding to the known carrier frequency. As noted in the specification (see, e.g., page 33, lines 19-27), forming the apparatus such that the combined length is substantially equal to one-half of the carrier signal wavelength provides maximum interference reduction by scattering about half of the radiated energy in one direction, while the other half is scattered in a substantially opposite direction.

Contrary to the presently claimed case, the apparatus (5) disclosed by Haapanen does not include a plurality of resonant circuit elements. Instead, the apparatus (5) merely comprises a round bar or strip (5) having the shape of an elongated rectangle (Haapanen — col. 2, lines 15-23). As such, Haapanen provides absolutely no teaching or suggestion that would enable a skilled

artisan to form the apparatus (5), such that a combined length of a plurality of resonant circuit elements is substantially equal to one-half of a wavelength corresponding to a carrier frequency. Thus, even if the teachings of Haapanen were combined with those of Lily, the combined teachings of the cited art would still fail to provide the guidance necessary for a skilled artisan to form a plurality of resonant circuit elements, as claimed.

CONCLUSION

The present amendment and response is believed to be a complete response to the issues raised in the final Office Action mailed May 9, 2011. In view of the amendments and remarks herein, Applicants assert that pending claims 1-9 and 24-27 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Daffer McDaniel, LLP Deposit Account No. 50-3268.

Respectfully submitted,

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Date: August 5, 2011
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